

**A NEW SPECIES OF *CHAMAESARACHA* (SOLANACEAE)
FROM MEXICO AND THE SEPARATION OF *C. CRENATA*
FROM *C. VILLOSA***

John E. Averett¹

Department of Biology, P.O. Box 8042, Georgia Southern University,
Statesboro, GA 30460-8042 U.S.A.
averett@gorgiasouthern.edu

ABSTRACT

Prior to a more comprehensive treatment of *Chamaesaracha*, a new species, *C. geohintonii*, a gypsophile from Nuevo León, Mexico is described. The species is most closely related to *C. crenata* and *C. villosa*. The latter two taxa are often difficult to distinguish and some workers consider these to be synonymous (Henrickson 2009). The salient features separating these several taxa are discussed. *Phytologia* 92(3): 435-441 (December 1, 2010).

KEY WORDS: *Chamaesaracha*, Mexico, Texas, Solanaceae

Examination of Mexican collections of *Chamaesaracha*, especially from around Parras, Coahuila and western Nuevo León, have provided additional insight into the status of *C. crenata*, *C. villosa* and an undescribed taxon herein recognized as *C. geohintonii*. The latter is most closely related to *C. crenata* but is smaller in habit and has a different vestiture.

***Chamaesaracha geohintonii* Averett & B.L. Turner, sp. nov.**

Herba perennis, caulis 15-20 cm alta, pubescentia; folia petiolata, 1.8-3.0 cm longa, lamina rhombica vel ovata, crenata vel undulata.

Chamaesaracha crenata similis.

TYPE: MEXICO. Nuevo León, Mpio. Mina, W of Los Molina, ca 26.04074 N, 100.44492 W, 943 m, "Gypsum hillside." 23 Jul 2007, G.B. Hinton et al. 28619 (Holotype: TEX-LL).

¹ Present address 2408 N 53rd Street, Omaha, NE 68104

Perennial herbs, branching from the base, ascending to nearly upright; vestiture of whitish, mostly simple, trichomes largely lacking glandular hairs; leaves 1-3(4) cm long, lamina ovate to rhombic, crenate to undulate, ca 2/3 the length of the leaf, apices typically obtuse to rounded, bases acute to shortly attenuate; flowers 1-2 from axils, corolla yellow-green, rotate, 1.0-1.5 cm across, calyces, 3-5 mm long, fruit a green berry ca 1 cm in diameter, pericarp thin, dry; seeds ca 25, reniform, rugose-reticulate, brown, 1.5-2.0 mm long.

The species is named for George B. Hinton, avid collector of the flora of north-central Mexico. Familiar with the area concerned, he called attention to the novelty, suggesting that it might be new.

Chamaesaracha geohintonii is closely related to *C. crenata*; the latter occurs principally in Coahuila, but populations are found along the Rio Grande River in southern Brewster Co. and adjacent Presidio Co. in the Big Bend Region of Texas; *C. crenata* is also close to *C. villosa*, which was originally described from Coahuila but also occurs in Chihuahua, Durango and Texas. Scudday (1965) first noted the presence of *C. villosa* in Texas.

Chamaesaracha geohintonii is known only from the type locality, which is northwest of Saltillo, where it occurs in gypsum soils, the site of several localized edaphic endemics (cf. Turner 2010). The distribution of the three species is shown in Figure 3.

Rydberg (1896) described *C. villosa* from near Saltillo, Mexico and *C. crenata* from Parras, ca 110 mi west of Saltillo. All areas of investigation indicate that *C. crenata* is closely related to *C. villosa* and, as already noted (Henrickson 2009), the two are frequently difficult to distinguish. As a part of his early graduate work, Averett (1967) suggested that the two were quite close and "if salient differences exist," they are not clear" but he made no taxonomic changes. Averett (1973) continued to recognize both species; he noted, however, that "the decision for varietal or specific status is somewhat arbitrary in this instance," but at the extremities of their ranges the taxa are relatively distinct and can be recognized by differences in leaf shape and pubescence, as noted in his key and in the original descriptions by Rydberg (1896), characters equivalent to those distinguishing other

species of the genus. Examination of previously unseen Mexican collections of *Chamaesaracha*, from Parras, Coahuila and those of western Nuevo León, and the reexamination of older material from that area, have provided additional insight into the *C. crenata*-*C. villosa* complex and strengthens the case for maintaining the two as separate species, as suggested herein.

In previous and subsequent studies, Averett (1973, unpubl.) found the type specimens of *C. crenata* and *C. villosa* to be distinct, as were other populations both in Mexico and Texas. For example, all of the populations from about Lajitas, Texas, northwest along the Rio Grande to Hudspeth Co., clearly compare to *C. villosa*, as do populations several kilometers south of Ojinaga, Mexico (e.g., Averett 156, 157, 158; Averett & Powell 184). There are a few relatively clear populations of *C. crenata* in Big Bend National Park (Averett & Sikes 238; Warnock 13909; Warnock & Johnston 15909). Populations in Mexico are mostly distinct, especially in and around the type localities.

Early in his studies, Averett suspected hybridization to be responsible for some of the overlap in characters between the two taxa. Plants obtained from three populations (Averett & Powell 217, 218, 219), all within 1 km of each other along the Rio Grande River, southeast of Lajitas, Texas on what is locally known as Big Hill, showed some evidence of hybridization, one plant comparing more to *C. crenata*, another to *C. villosa*, and one intermediate. Flavonoid analyses (unpublished) were done on these and other populations of the complex. Similar flavonoid profiles were found in the two species but, interestingly, some additional, highly methylated compounds, were found in the suspected hybrids. These might represent "hybrid compounds" similar to those found in *Baptisia* (Alston et al., 1965) but do not provide conclusive evidence of hybridization.

Another problematic area is to the north and east of Big Bend National Park, east to about Val Verde Co.; in this region there are some exceptionally robust plants in the Black Gap area, just north of the Park, that might be confused with *C. crenata* but otherwise are like *C. coniodes* and possess tetraploid chromosome counts of $n = 24$. Both *C. crenata* and *C. villosa* are diploid with $n = 12$. I now think that most, if not all, of those populations north and east of Brewster Co. in Texas, previously identified as *C. crenata*, are more likely *C. coniodes*.

Since the two taxa are distinct in and around their type localities and in all but a few populations in Trans-Pecos, Texas, I believe the continued recognition of *C. crenata* and *C. villosa* is warranted. *Chamaesaracha geohintonii*, because of its unique vestiture, small leaves, small habit, and more eastern distribution, is not likely to be confused with *C. crenata* or *C. villosa*, nor with other likely relatives such as *C. sordida*. A comparison of the three species is found in Table I. Distributions of the three species, and drawings noting leaf-shape and trichomes are presented in Fig. 1. Photographs of the types of *C. crenata* and *C. villosa* from the Smithsonian Type Specimen Registry can be found online (<http://botany.si.edu/types/>).

ACKNOWLEDGEMENTS

I am grateful to Guy Nesom for the Latin diagnosis and to my Academic Father, B.L. Turner, for calling to my attention the type specimen of *C. geohintonii*. He also suggested the eponym concerned. My wife, Audrey Averett prepared the line drawings and assisted with Figure 1. Robert Hattaway provided helpful comments on the manuscript.

LITERATURE CITED

- Alston, R.E., H. Rosler, K. Naifeh and T. Mabry. 1965. Hybrid compounds in natural interspecific hybrids. *Proc. Natl. Acad. Sci.* 54: 1458-1465.
- Averett, J.E. 1967. Taxonomic studies in *Chamaesaracha* (Solanaceae): Trans-Pecos Species. MA Thesis, Sul Ross State University, Alpine, Texas.
- Averett, J.E. 1973. Biosystematic study of *Chamaesaracha* (Solanaceae). *Rhodora* 75: 325-365.
- Henrickson, J. 2009. New names in *Chamaesaracha* (Solanaceae). *Phytologia* 91:186-187.
- Rydberg, P.A. 1896. The North American species of *Physalis* and related genera. *Mem. Torrey Bot. Club* 4: 279-374.
- Scudday, J.F. 1965. *Chamaesaracha villosa* new to Texas. *Rhodora* 67: 770.

Turner, B.L. 2010. *Xanthisma pseudorestiforme* (Asteraceae: Astereae), a new gypsophile from Nuevo Leon, Mexico. Phytoneuron 2010-40:1-4..

Table 1. A comparison of three species of *Chamaesaracha*.

	<i>C. crenata</i>	<i>C. villosa</i>	<i>C. geohintonii</i>
Habit	Robust , stems ascending, 15-40 cm long	Robust , stems ascending, 15-40 cm long	Small plants, stems ascending to upright, usually 15 cm or less
Habitat and distribution	Desert soils, principally in Coahuila	Desert soils, principally in Coahuila and Chihuahua	Gypsum soils in Nuevo León
Pubescence	Long trichomes with an understory of glandular hairs	Villous with long, often forked trichomes, glandular hairs largely lacking	Long unbranched trichomes, glandular hairs largely lacking
Leaves	Petiolate, 4-6 cm long, lamina ovate to rhombic with margins crenate-undulate, ca $\frac{3}{4}$ the length	Sessile to subsessile, 4-6 cm long, lamina oblong, ovate or rhombic, margins entire to dentate	Petiolate, 1-3 (-4) cm long, lamina ovate to rhombic, margins crenate-undulate, $\frac{2}{3}$ the length



Fig. 1. *Chamaesaracha geohintonii* (Holotype: TEX).

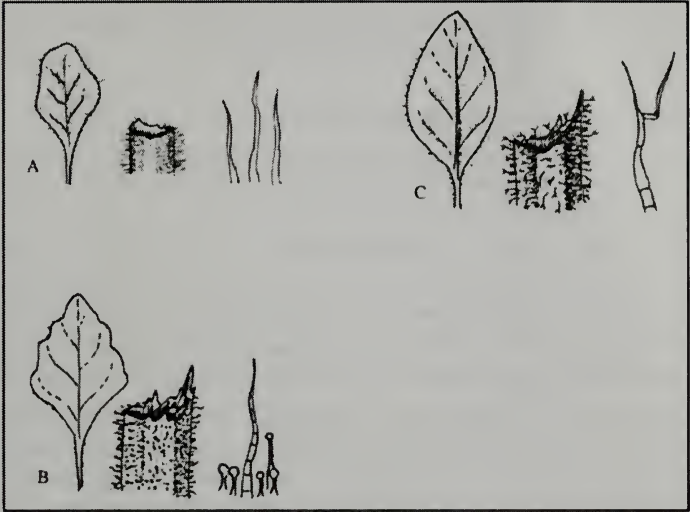


Fig. 2. Leaf outlines, stem, and pubescence types: *Chamaesaracha geohintonii* (A), *C. crenata* (B), and *C. villosa* (C).

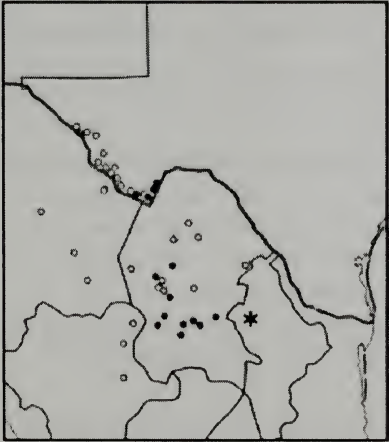


Fig. 3. Distribution of: *Chamaesaracha crenata* (closed circles), *C. villosa* (open circles) and *C. geohintonii* (asterisk).